

# ECONOMIC SCIENCES

## MINIMIZATION OF RISKS IN THE INVESTMENT ASSETS PORTFOLIO FORMATION

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**Introductions.** During the investment strategy formation, an extensive search and an assessment of alternative investment solutions are carried out, which most closely correspond to the Company's image and the objectives of its development.

The process of strategic management of the Company's investment activities is detailed in its tactical management through the Company's investment portfolio construction.

**Aim.** The mutual investment fund faces the task of determining the structure of the optimal investment portfolio, this task can be solved by means of the Analytic hierarchy process, which provides the decomposition of the problem into simpler component parts. This determines the relative significance of alternatives that are studied for all hierarchy criteria. Relative significance is expressed as priority vectors.

**Materials and methods.** The most significant elements of the problem are identified at the first stage, and the best way to check the test results and assessment of the elements at the second stage, the next stage is the decision analysis and assessment of its quality.

The process can be performed over a sequence of hierarchies. In this case, the results obtained in one of them are used as input data in the next.

In case of the pair-wise comparison of criteria is used the degree of their significance, alternatives according to the criteria, the degree of attractiveness. The ratio scale is used in both cases.

In this task are taken the following criteria of importance for the mutual investment fund: K1 - risk degree; K2 – income value; K3 - risk hedging possibility; K4 - liquidity; K5 - tax advantages; K6 - minimum investment amount.

To compare the criteria and alternatives in pairs according to the criteria is used the scale from 1 to 9.

Comparing the alternatives concerning the criterion, the attractiveness alternatives for mutual investment fund are accepted, the effect of each criterion: A1 - bank deposit; A2 - money market instruments; A3 - treasury bond; A4 - ordinary shares; A5 - precious metals; A6 - real estate.

The homogeneity of judgments is estimated by the homogeneity index (*HI*) or the homogeneity relation (*HR*):

$$HI = (\lambda_{max} - n)^n / (n - 1)^n$$

$$HR = HI / M(HI);$$

Where  $\lambda_{max}$  is the largest eigenvalue of the pair-wise comparisons

M (*HI*) – the average value (expected value) of *HI*.

For the matrix of the solvable task, ( $n=6$ )M(*HI*)=1,24.

**Results and discussion.** The implementation of this model (DSM package, Optimal Multicriteria section) gives the following **results**:

Alternatives	K1	K2	K3	K4	K5	K6	
A1	0.3489	0.0749	0.3776	0.4121	0.4392	0.4991	0.2788
A3	0.3739	0.4164	0.2818	0.2096	0.0671	0.2105	0.3344
A3	0.1048	0.1517	0.1682	0.1984	0.1457	0.0793	0.1438
A4	0.0965	0.2719	0.1071	0.1007	0.2812	0.1365	0.1653
AS	0.0382	0.0511	0.0362	0.04	0.0268	0.0426	0.0417
A6	0.0377	0.0341	0.0292	0.0350	0.0400	0.0360	0.0360

Priority	0.3303	0.3303	0.1340	0.1340	0.0416	0.0298
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$\lambda_{max}$	6.4294	6.2336	6.4767	6.1135	6.2856	6.3152
HI	0.0859	0.0467	0.0953	0.0227	0.0570	0.0630
HR	0.0693	0.0377	0.0769	0.0183	0.0446	0.0508

**Conclusions.** All *HR* assessments are  $<0.1$ , that tell us about the homogeneity of judgments. By this means, it can be concluded that the most attractive alternative for the investor during the diversified portfolio construction is money market instrument (priority 0,3344). Less attractive is bank deposit (priority 0,2788) and, finally, completely unattractive - precious metals (priority 0,0417) and real estate (priority 0,0360).